Network Aesthetics

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Introduction
Network Aesthetics

Only connect!
E. M. Forster (*Howards End*)

Something huge and impersonal runs through things, but it's also mysteriously intimate and close at hand. At once abstract and concrete, it's both a distant, untouchable order of things and a claustrophobically close presence, like the experience of getting stuck in a customer service information loop every time you try to get to the bottom of things.
Kathleen Stewart (*Ordinary Affects*)

Encounters with Network Form

In E. M. Forster's 1910 novel *Howards End*, the protagonist Margaret Schlegel urges the individualistic Henry Wilcox, "Only connect!" Margaret's "sermon" to Henry counsels intersubjective sympathy and implores him to "live in fragments no longer."[1] In this early twentieth-century moment, prior to the outbreak of World War I and the full-blown onset of modernity, Margaret's idea of connection seems a perfectly innocent moral imperative for Henry's salvation. A century later, it no longer makes sense, as it may have within modernism, to formulate connection as an aspiration.

In an early twenty-first century world saturated increasingly by always-on computing, pervasive social media, and persistent virtual worlds, connection is less an imperative than it is the infrastructural basis of everyday life.[2] In place of the choice implicit in the insistence that we only

0.1. *Journey* (thatgamecompany, 2012).

connect, we are now reminded constantly of the alleged fait accompli of interconnection. This feeling of linkage, often from a distance, becomes sensible in thatgamecompany's *Journey*, a popular and critically acclaimed videogame released in 2012. In this game, the player guides a robed avatar through a lonely desert world. A few minutes into the game, the player discovers that *Journey* is in fact a networked experience in which she can encounter other players but cannot communicate or coordinate goal-oriented actions with them using language, via either the instant messaging or voice chat options common to most online games (fig. 0.1). The game evokes an atmosphere of intense alone-togetherness—a feeling of being with another person across an unknown distance. As one anonymous player observes in *Journey Stories*, a Tumblr blog that receives contributions from the game's fans, "When our journey ended after about 90 minutes it was in an immensely cathartic moment, in a way that no game has ever made me feel before. It is hard to explain how the game evokes emotions. How masterfully it plays with the feeling of *connectedness*."[3] Unlike Forster's "Only connect!" this response treats "the feeling of connectedness" as a common affective state, a default condition with which an artful game "plays." At the same time, this player's response also gestures toward linkage as a problem and an unfolding temporal experience that is fleeting, constrained, rare, and "hard to explain." This opening juxtaposition of a modernist novel with what we might call a post-postmodernist videogame suggests the varied ways that divergent cultural forms attempt to make sense of human relations at different historical moments.

The argument of *Network Aesthetics* is that the problem of global connectedness cannot be understood, in our historical present, independently of the formal features of a network imaginary. By network imaginary I mean the complex of material infrastructures and metaphorical figures that inform our experience with and our thinking about the contemporary social world. This book explores aesthetic and affective encounters with network form through a comparative media approach that spans the novel, film, television serial, digital game, and transmedia alternate reality game. This method is closely tied to the growing interrelationship among cultural forms that digital and networked technologies make possible in our time—as well as the increased embeddedness of these forms in everyday life.

Networks, a limit concept of the historical present, are accessible only at the edge of our sensibilities. Networks exceed rational description or mapping, and it is at this point that we might turn to aesthetics and cultural production for a more robust account. Though this introduction offers a broader transnational and historical context for thinking about networks, the chapters that follow focus on US literature, visual media, and digital productions of the late twentieth and early twenty-first centuries. In selecting these coordinates in space and time, I address the rise of network science that converged with widespread cultural, economic, political, and technological interest in networks that flourished in the United States. At the same time, close attention to this group of cultural works generates a more coherent narrative and constellation of concepts that informs a larger transdisciplinary body of scholarship about networks.

In its most common present-day iteration, a "network" is a structure composed of links and nodes. It is a figure for a proliferating multiplicity that at once enables and challenges our very capacity to think. The word "network" is certainly not new and has been in use for hundreds of years. It was not until the mid-twentieth century, however, that scientists, humanistic scholars, and artists alike began to use a more generalized network vocabulary to describe new visions of a post–World War II world. Since the 1970s, the interdisciplinary study of complexity has come to encompass a wider range of research on social networks, systemic resilience, emergence, and connectivity. A resurgence and expansion in the study of networks that began even later—in the 1990s—has taken disciplinary shape through the field of network science. This development was enabled by new techniques of mapping and visualization but perhaps just as centrally by the proliferation of the network as the principal architecture and most resonant metaphor of the globalizing world. Since the late twentieth cen-

tury, scientists, politicians, journalists, poets, and artists have increasingly framed the world in terms of the interconnection of people and nations, objects and economies, transportation hubs and computers. Networks, across these contexts, have become practically ubiquitous as both literal infrastructures and figurative tropes. The most conspicuous example of the conflation between these aspects of the network imaginary is arguably the Internet, which is not simply a system of linked computer networks but also a figure through which we experience a concatenated world. Alongside computer networks, the language of networks began to frame a confusingly diverse range of forms: terrorist networks, economic systems, social media, disease ecologies, neural structures, and traffic patterns. The science of networks has come to influence disciplines that include biology, economics, epidemiology, informatics, neurology, and sociology.[4]

This proliferation of network discourse has led Bruno Latour to observe, "The word network is so ambiguous that we should have abandoned it long ago."[5] Indeed, maybe we *should* have abandoned the word. But we have not done so. The language of networks shows no sign of abating anytime soon. In the transdisciplinary enthusiasm that orbits the concept, "network" is far too easily taken up as a term that we should already know. However, as Nietzsche observes, "What is familiar is what we are used to; and what we are used to is most difficult to 'know'—that is, to see as a problem; that is, to see as strange, as distant, as 'outside us.'"[6] In approaching our network imaginary as a problem, it would be an impossible undertaking to write a history of *the* network, as if "network" were a discrete, containable thing with both a singular origin and a clear referent.[7] First of all, there are many things that we call networks in the early twenty-first century. Second, to further complicate matters, networks are ontologically slippery, approached simultaneously as objective things in the world—natural structures or infrastructural technologies—and as metaphors or concepts to capture emergent qualities of interconnection in our time. Third, the language of networks, though currently dominant, may be only one way to conceptualize contemporary connectedness. In order to make other figures thinkable or imaginable, however, I propose that we must first come to terms with a diverse network imaginary. The language and representational strategies associated with these structures have surely grown normative and familiar. To call something a network often serves as a cliché rather than, as it once did, an evocative metaphor of relationality or a nonhierarchical model of interconnection. The word "network" is thus a keyword of the historical present, but at the same time, given its relentless usage, it increasingly lacks descriptive edge.

While the language of networks might be omnipresent, these forms are most distinctly felt, materialized, and conceived through the experience of everyday media and ordinary social practices. Such experiences may occur in the ambient togetherness afforded by social media platforms like Facebook or Snapchat, the stranger sociality enabled by smartphone apps like Grindr or Tinder, or the overwhelming sense of obligation triggered by something as common as an overloaded email in-box. Social scientists have already explored many such platforms and apps.[8] Along with the cultural anthropologist Kathleen Stewart, I believe that the process of studying ordinary situations, as they unfold, can help to "record the state of emergence that animates things cultural" and "to track some of the effects of this state of things."[9] This book also attends to ordinary experiences of connection, but it does so through literary and art works that heighten sensitivities to and encourage layered reflection on everyday embeddedness in networks.

All of the works that I examine in this book seek to defamiliarize and make networks sensible through what I call *network aesthetics*. As I elaborate below, the category of "aesthetics," for me, serves as an expansive rubric for sensing and thinking through culture. A number of narrative and visual works that preceded the rise of computing and networking in the latter half of the twentieth century, including novels and films, already deployed various techniques—from multiprotagonist narratives to cinematic crosscutting—to instantiate networks. These older forms have further mutated in response to the cultural zeitgeist of the network. At the same time, since the late twentieth century, new media forms such as online videogames and transmedia narratives have opened up new vistas for apprehending networks by inviting people to play with, alter, and experience them from the inside. My core interest lies in the way that different cultural forms access networks through a range of both medium-specific and transmedia features that include narrative, text, images, audio, and procedural or participatory interactions. These elements prime us to undertake cognitive but also somatic and affective encounters with networks. While feelings of interconnection are the starting point of my analysis, the works I study also deploy network forms to foreground experiences that I examine across five chapters: senses of historical situatedness in the present, emergences of complexity over time, modes of realism that become available with the greater centrality of networks, perceptions of technologically enabled sociality from a distance, and propositional relations made possible by networked media.

To briefly illustrate the way a cultural work might offer aesthetic insight into a network imaginary, consider *We the Giants* (2009), a browser-

0.2. *We the Giants* (Peter Groeneweg, 2009).

based, 2D side-scrolling platform game created in Flash that depends on networked gameplay yet never allows real-time interaction with another person (fig. 0.2). In this short, linear digital game, a single player controls a square-bodied cyclopic creature. The player communicates with other nonplayer characters that offer basic instructions about how this race of giants participates in a ritual of sacrifice. On the final screen of the game, the player zooms out to discover the game's key objective—the acquisition of a star that is located in the upper reaches of the night sky. However, in most cases, the player can come nowhere near the star. In the only truly agential act in the game, the player has the option of sacrificing her body as a stepping-stone that might allow the next player to come closer to the shared goal of touching the star. Thus the player collaborates asynchronously and serially with a network of hundreds of other players whom she cannot direct or control, except indirectly through the residue of previous play-throughs and the tactical placement of her body, which is surrendered through suicide. Through its specific mechanic of sacrifice, the game foregrounds the importance of a collectivity—anonymous yet united in its purpose—to achieving what remains impossible for an individual. Even though it does not allow the player to interact with another player in real time, as she might in a standard networked multiplayer game with a chat option, *We the Giants* serves as an aesthetic microcosm that makes a network of relations sensible through the constraints that it imposes on copresence. By removing the possibility of instant communication, the game emphasizes our

daily reliance on computer networks for communication and coordination. Though this feeling of alone-togetherness is a common quality of life online, the artful design of *We the Giants* encourages deliberate reflection on the pleasures, uncertainties, frustrations, and dependencies of networked technologies.

In its attentiveness to a wide range of cultural works, including the aesthetics of videogames such as *We the Giants*, this book attempts to revise the common treatment of networks as control structures that originated in the computing and cybernetics research of the early Cold War. Many analyses of networks in the humanities focus largely on their structural dimensions, but I hope to attend to those microlevel affects and effects that are a key domain of literary and art works. Beyond the sublime of interconnection, which is a dominant mode of encountering systemic totalities, network aesthetics concern the ordinary affects of networked life-worlds—their promises and failures, their freedoms and constraints. What senses of networks, I ask, become available when we begin an analysis of the Internet, for instance, not with technical protocols but with everyday affects (such as expectation or frustration) that they generate? How do we understand networks when we treat them as forms through which people daily encounter, manage, and construct quasi-anonymous forms of being—whether the ambient reciprocities afforded by social media such as Facebook or uncertain feelings about the vicissitudes of the global economy? And how, then, might attention to ordinary connections and network aesthetics influence how we experience and engage an extraordinarily interconnected culture characterized by social media, networked games, virtual worlds, new media artworks, mobile devices, and rapid transnational flows of people and ideas?

As I hope to show, connection, in our time, has become an assemblage of ordinary problems that animate the spectrum between linkage and disconnection—problems that nonetheless retain some traces of an earlier yearning for contact and generate a sense of networks that do not quite work. Since the late twentieth century, the phrase "everything is connected" has become indecipherable. It simultaneously connotes a felt fact of contemporary life, a metaphysical discovery, and a scientific paradigm; a banal catchphrase of globalization, an ideology of digital media, and a fantasy of social sublimity; a provocation that surges forth from experiences of alienation, a reaction formation developed through encounters with irreducible complexity, and a corollary of a control society; a corporate slogan, a paranoid pronouncement, and a realization of apophenia; an idea that

burgeons from deep human bonds, a sense that rises out of ephemeral affinities, and an impossible desire for ambient intimacy; an epistemological foundation, an experience of diaspora, and a utopian impulse; and perhaps still, as in *Howards End*, a spiritual conviction. Whether exceptional fact or ordinary affect, belief or desire, interconnection in the twenty-first century seems ubiquitous and unavoidable. Network aesthetics contribute to a fuller experience and account of our network imaginary.

The Emergence of a Network Imaginary

This book does not set out to define "network" or to translate this concept into a static form (both all-too-common analytical operations that offer a false sense of mastery). Nevertheless, it is useful to delimit the concept of the network, if only in a provisional or heuristic manner, before turning to the specific transmedia interventions that are my ultimate concern. In its most generalized form—the one promulgated, for instance, by network science—a network is a complex and interconnected structure made up of groups of "nodes" that are interconnected by "links." The best-connected of these central nodes are called "hubs." The form of the network, as it is most commonly taken up, departs from the organizational schemes of classical centralized systems and traditional hierarchies, adopting instead decentralized or distributed modes of operation. Although there are several types of networks, the primary characteristics shared by these structures are openness, flexibility, extensibility, complexity, internal asymmetry, and an interdependence of individual parts.[10]

Regardless of its nodal composition, a network is never a static structure, even as network graphs, maps, or visualizations might sometimes suggest a fixed form. Networks depend on an active flow among interlinked vertices. As the sociologist Manuel Castells puts it, a network is "susceptible to innovating without threatening its balance."[11] Alexander Galloway and Eugene Thacker go a step further to suggest that perhaps the fundamental feature of a network is its capacity for "radically heterogeneous transformation and reconfiguration." In this sense, interconnected operability, online access, and a live status are not merely possible states but the necessary and defining conditions of any network.[12] Indeed, one of the difficulties of even naming, let alone thinking through, networks is that they are inherently emergent—capable of spatiotemporal transformations and scalar shifts. The very notion of *a specific and nameable network* becomes problematic, thereby signaling the term's instability.[13]

Within the sciences, social sciences, and humanities alike, the term "network" comes most consistently to take on two different referents that include technological or communication systems, on the one hand, and social organization, on the other. In the first instance, a network is a tool or an interconnected system (e.g., a telegraph network, the World Wide Web, or a social media platform). In the second, a network is a configuration of human or nonhuman actors (e.g., the Underground Railroad, a guild in a massively multiplayer online game, or the US economy). As Latour notes, Castells blurs these meanings in his characterization of the network as "a privileged mode of organization thanks to the very extension of information technology."[14] Since Castells's formulation of the "network society" in 1996, we have seen an accelerated economic, political, and cultural dependence on communications technologies (especially those numerous systems and processes commonly bundled into the signifier "Internet") for production, transmission, storage, and organization.

While networks, in Castells's dual sense, take on a new significance beginning in the mid-twentieth century, these structures have a long history. The word "network" (an amalgamation of the Old English words "net" and "weorc") emerged in the sixteenth century, at which time it referred to a piece of work, such as manufactured fabric, in which threads or wires were interlaced into an intersecting arrangement. In the seventeenth century, the word was extended from nonliving objects to living ecologies and biological structures such as cells. As Armand Mattelart explains, even preceding the widespread usage of the word, the image of the network appeared in the late seventeenth century through "metaphors of the living organism, and especially those taken from the circulation of the blood," such as references to "the reticular body." The concept, especially in France, also came to inform both "science and military cartography," including "fortifications" that were imagined as a "complex system of 'arteries.'"[15]

It was not until the nineteenth century that the connotations of "network" edged closer to the word's common contemporary usage to describe communication systems. For the first time, in these years, the word "network" was recorded in reference to a variety of complex, netlike systems, including interconnected business organizations, transportation routes, telecommunication lines, and electrical structures—all part of an emerging imperial world system.[16] The first modern communication technology to aspire to rapid nationwide connectivity (albeit not yet "transnational" or "global" linkage) was the French semaphore telegraph network, invented by the Chappe brothers in the 1790s. This optical and signal system of tow-

ers enabled communication across approximately three thousand miles of French territory. Even so, this early form of the telegraph was scarcely used for commercial or civil purposes—applications that would only become viable well after the innovations of William Cooke, Charles Wheatstone, and Samuel Morse on the electric telegraph in the 1830s. Along with telegraph lines, railways contributed to the proliferation of the language and metaphor of networks in the nineteenth century throughout Britain, continental Europe, and the United States. As Mattelart demonstrates, technical inventions, especially as they became more accessible and popular, connected the abstract concept of a network with "new types of exchanges between people" and even suggested possibilities of "a new democracy." Transportation and communication systems in the nineteenth century already carried an aspirational dimension, which aligns with the Enlightenment ideal of rationality that "links, unites and guarantees the free flow of people and goods."[17] With the transition into the twentieth century, a network imaginary began to unfold in the realm of communications, and also in media (a central concern of this book), in the shift from technical media—Friedrich Kittler's triumvirate of gramophone, film, and typewriter—to networked media such as radio, television, and the Internet.[18]

As forms that become visible across a transdisciplinary and transnational scope, networks have a history that might be best restricted (again, heuristically) to the period following World War II. It was not until the late twentieth century, as Luc Boltanski and Eve Chiapello observe, that "the network" emerged as a normative concept that could be applied to everything from the human brain to the global economy to geopolitics to even the Earth itself as an interconnected totality. These years saw the emergence of a new "mode of judgment which, taking it for granted that the world is a network (and not, for example, a structure, a system, a market or a community), offers fulcra for appraising and ordering the relative value of beings in such a world."[19] Pronouncements of global interconnectivity by Marshall McLuhan and Buckminster Fuller in the 1960s were still prescriptive; by the 1990s similar observations were already (at least understood broadly to be) descriptive—and no longer radical.

I contend that three major, and roughly parallel, developments that began in the middle of the twentieth century and took a programmatic form by the 1990s imbued a generalized network concept with the explanatory power and reach that it has achieved in the early twenty-first century. These three developments, none of which should be read as deterministic, are rarely discussed together. Juxtaposing these narratives, however, suggests the historical complexity of our current network imaginary. First,

a series of mathematical and scientific innovations produced a theoretical framework within which to think about networks. This work made possible, ultimately, network science—arguably the most coherent and influential articulation of a generalized network structure in the late twentieth century. Second, though communications networks in the nineteenth century already included extensive material substrata such as railway and power lines, American-led development of the Internet and its decentralized informational architecture instantiated the network model, both materially and metaphorically, at a global scale. Third, neoliberalism and the postindustrial economy, as well as forms of resistance to these systems, began to embrace networks as key organizational and conceptual models. Each of these three transformations, which are interrelated, requires a brief overview because, together, these scientific, media, and geopolitical coordinates serve as a foundation for the imaginary that the various cultural works I explore in this book defamiliarize, intensify, and challenge.

First, network science has been crucial to the theoretical foundation and intellectual legitimation that has allowed networks to flourish as a dominant present-day epistemological model in the sciences and the humanities. This history informs many of the works I analyze in the following chapters. Even as graph theory constitutes the mathematical foundation of network science, a systematic study of interconnected structures can be traced back most directly to 1940s general systems theory.[20] Serving as a response to scientific reductionism, systems theory came eventually to influence the renewed mathematical interest in cryptography and computation during World War II and the field of cybernetics that developed after the war. The language of networks began increasingly to inflect scientific research during these years.[21] That scientific discourse was far from neutral, already serving the imagination of a fledgling military-industrial complex. Along with fields such as mathematics and the biological sciences (which had a longer history of deploying network metaphors), the social sciences first began a serious study of networks in the 1950s and 1960s, which saw the proliferation of quantitative methods within fields such as sociology and psychology. These approaches made possible a new research agenda concerned with networks, which included Stanley Milgram's well-known 1967 "small world" experiment that examined the "six degrees of separation" between any two people in the United States.[22] Graph theory, systems theory, and social network analysis all contributed to the present-day scientific interest in networks. Even so, the interdisciplinary field of network science did not form a coherent research program until the 1990s.[23]

Second, the gradual development of the Internet after World War II has

been crucial in realizing a network imaginary at an infrastructural level and making it, in the early twenty-first century, a material reality for billions of people around the world. According to Castells, communication and information networks since the 1980s represent a significant change in *type* rather than mere *degree*. These systems provide "the material basis for [the network's] pervasive expansion throughout the entire social structure."[24] Today, everything from daily communications to traffic lights to weapons systems depends on interlinked material infrastructures. As early as 1997, Bill Clinton's administration realized the unprecedented significance of computer networks and databases to US interests, establishing the President's Commission on Critical Infrastructure Protection to defend the digital frameworks that support every facet of life.[25] While there are already many histories of the Internet, my focus on the relationship between material technologies and imaginaries in the following chapters makes it useful to foreground the coemergence of this system alongside network form at the outset.[26]

Cryptography efforts in the 1940s as well as postwar cybernetics, informatics, and computing research all contributed to an interest in interconnected technologies among scientists and engineers. In the early 1960s, Marshall McLuhan already imagines the "electronic interdependence" of the "global village." Even so, in texts such as *The Gutenberg Galaxy*, he draws not from technology or engineering but, primarily, from a romantic imaginary made possible by thinkers such as Pierre Teilhard de Chardin. In *Understanding Media*, he deploys numerous metaphors to capture an increasingly linked world, arguing that the mechanical "explosion" of industrialism has ceded to an electronic "implosion." He imagines new media extending the human "central nervous system itself in a global embrace, abolishing both space and time as far as our planet is concerned."[27] Although McLuhan's celebration of a globalized network was premature, especially at a technical level, by the late 1960s computer scientists and engineers were already beginning to envision the possibility of computers that operated not merely as calculating devices but as expressive media and distributed communication technologies. In 1969, the Defense Advanced Research Projects Agency (DARPA) established a limited military packet switching network called ARPANET. By 1973, computer scientists had developed a new technical protocol (TCP/IP) that replaced a closed network model with a flexible and open architecture.[28]

The popularization of the Internet within consumer culture and growing public consciousness of networks, even in the United States, came fairly

late in the twentieth century. The emergence of nonnetworked personal computers in the 1970s gave many American users, outside of military and university settings, an initial experience of interactive computing. In the 1980s, personal computers grew in popularity and, despite limited practical applications, found a place in many American households. Even as vibrant research into the production of a commercially viable Internet continued alongside the rise of personal computers, computer networks did not enter mainstream experience during these years. As the sociologist Thomas Streeter argues, "Networking was ignored in part because the dominant culture was seeing things through free-market lenses and thus imagined that microcomputers were about isolated individuals buying and selling objects." In fact, "information" (a concept that enabled the conversion of complex processes into concrete things, products, or pieces of property) was a more prominent computing metaphor in these years than "network."[29] Even in its earliest popular version, in the late 1980s and early 1990s, the Internet was more often imagined as an "information superhighway" than as a "network of networks" (as Tiziana Terranova described it a decade and a half later).[30] Even as late as 1993, as Streeter demonstrates, computers were already a norm in the United States, but going online was still a rare experience. The Internet did not enter widespread public consciousness until the introduction of two "user-friendly" technologies—the World Wide Web (introduced by Tim Berners-Lee in the early 1990s) and graphical web browsers (including Mosaic in 1993 and Netscape Navigator in 1994).[31] It was thus not until the mid-1990s that the generalized network concept attached to a dominant communication technology and came to impact everyday experiences of most first-world subjects, initially in the United States and subsequently around the world.

Third, the proliferation of the network concept is connected closely to the expansion of US neoliberalism and finance capitalism, as well as resistances to it. In the 1960s, the network imaginary was central to countercultural movements such as New Communalism as well as to the New Left's broader adoption of news media, especially televisual networks, as a key aspect of its strategic planning in anti-Vietnam protests.[32] By the 1970s, networks had already lost some of their oppositional charge with the rapid expansion of free market ideology that was strengthened by the deterioration of the Bretton Woods System of international monetary management, the rise of financial privatization, and the shift toward deregulation as a dominant American policy. The sense of decentralization inherent in network form aligned with these developments and served as a model for the

fundamental techniques of post-Fordism, including flexible production, affective labor, and the centrality of information technology. Indeed, this movement from industrial to postindustrial society is at the core of what Castells means in his sociological formulation of the "network society." A sense of increased global interconnection in this transitional era can be traced, in part, through a parallel movement from "machine" metaphors to "network" metaphors.[33] This change in figurative language also sees parallels in the shift from the language of self-consistent and structurally complex "systems" to socially infused and live "networks." Such rhetorical transformations marked considerable changes in corporate practices. Alan Liu, for instance, identifies "networking" in the 1980s and 1990s as the dominant information technology paradigm in business, which brought about a transition from an earlier mainframe-enabled "total" or "synoptic" experience to more horizontal forms of connectivity enabled by Internet communication and new opportunities for transnational transportation.[34]

Networks, then, are not only theoretical figures or technological infrastructures. They also serve as organizational blueprints for different forms of economic, political, and social life. As theorists such as Manuel Castells, Wendy Chun, and Alexander Galloway have demonstrated, networks often suggest a new diagram of power and a decentralized management style that undergirds the transition from Foucault's disciplinary societies to Deleuze's societies of control.[35] Networks are, moreover, not always liberating alternatives to the concentrated nucleus of power that accompanies centralized organization, even if the deployment of the term has often suggested a utopian freedom. Networks represent more complex forms of ideology that inform contemporary labor, organize dominant thought styles, and reformulate the parameters of human identity and interrelation. Despite the claims of early techno-libertarians, network structures and technologies do not usher in an age of wholly decentralized power, unproblematic democracy, or, in Bill Gates's infamous formulation, "friction-free capitalism."[36] These structures build upon previous systems of power and give rise to emergent systems of control. They also bring forth new forms of resistance, including technologically oriented opposition in the form of "hacktivism" and "exploits," as well as social movements or concepts of anticapitalist struggle such as Michael Hardt and Antonio Negri's "multitude," which have been inspired by a subversive understanding of network organization.[37]

Thus far, my examination of the rise of a generalized network concept in the late twentieth century may suggest that it is more proper to fields such

as mathematics, computer science, and economics than to the disciplines of the humanities. However, this concept appears in some of the most influential humanities scholarship produced during this same period, in a variety of ways, as metaphor, model, method, and material infrastructure. Additionally, the sciences in this period came to influence the humanities in key ways, including through fields such as cybernetics, statistics, and network science. For these reasons, a brief review of some of these usages is necessary before turning to my own focus on network aesthetics as they play out across media that draw on and transform both scientific and humanistic sources.

The term "network," and the interdisciplinary vocabulary that accompanies it, come into play throughout late twentieth century humanities research. Indeed, some of the most familiar and influential humanities scholars can already be treated as network thinkers. In comparative literature and area studies, we find networks in metaphors of transnational "circulation" of languages, "linkage" among cultures, and "relations" to the Other, as in the seminal postcolonial thinking of Édouard Glissant.[38] The term also travels through continental philosophy, especially through Gilles Deleuze and Félix Guattari's articulation of the "rhizomatic" network in their magisterial 1980 work *A Thousand Plateaus*.[39] In the discipline of history, Michel Foucault also relies heavily on the language of networks in his practices of "archaeology" and "genealogy."[40]

The critical theory of the mid-to-late twentieth century tended to treat networks in fairly abstract terms; early twenty-first century work in the humanities has, by distinction, taken up networks as concrete entities. Emergent humanistic fields, such as the digital humanities and new media studies, have demonstrated new ways of studying networks as powerful methods and material infrastructures for organizing and analyzing knowledge. In both of these capacities, networks have also influenced new forms of collaborative and multimodal scholarship. In the digital humanities, network methods have played an important role in experiments with social network analysis and relational sociology. Scholars across the humanities have sought to use visualization tools to understand and analyze heterogeneous and complex data sets related, for instance, to the exchange of historical documents and the production of literary texts across periods.[41] Others, in media studies, have explored the historical and cultural dimensions of networks. The field of media archaeology offers rigorous studies of both old and new communication networks as diverse as the postal system, the telegraph, undersea networks, and the Internet.[42] In new media

studies, networks have been central objects of study through research in areas such as virtual worlds and social media.[43] In a more generalized sense, theorists such as Alexander Galloway, Eugene Thacker, and Steven Shaviro have focused on networks as key figures for media theory.[44] Much of the existing scholarship in the humanities has deployed network metaphors or approached networks from an ontological, epistemological, and archaeological standpoint.

Certainly scholarship in art history and media studies has considered the aesthetic dimensions of networks going back to the pre-Internet experiments within avant-garde movements such as Fluxus, postformalism, performance art, and mail art. But we have not yet seen a sustained comparative media analysis of the relationship of networks to various cultural forms that accompany and mediate our ordinary and habituated experiences of these structures.[45] This book, then, turns to narrative, visual, and procedural art forms that encourage an active, critical, and even transformative engagement with the network as the new dominant configuration and category of life. Networks leave traces throughout everyday life in the contemporary period. Literary and artistic works pick up these traces and register key tensions and contradictions of network form in a heightened and concentrated way. The pedagogy of such works, in turn, promotes a sharpened analytical perspective on the everyday aesthetics of everything from social media to banking interfaces. In this way, the network imaginary also entails and requires a more capacious understanding of aesthetics, as well as culture, than the one that comes to us from both classical and modern aesthetic theory.

Aesthetics in the Era of Networks

Before elaborating network aesthetics as such, the concept of aesthetics itself requires careful consideration. The term "aesthetics" has widespread usage and includes a diverse set of phenomena such as formal appreciation, taste, pleasure, embodiment, play, and affect.[46] Though I offer a more precise frame for approaching aesthetics, I do not depend on a restrictive definition throughout the book but rather treat it as a heuristic that embraces the varied usage of the term in literary studies, art theory, philosophy, and related fields. For me, the term opens up an inquiry into a variety of concepts connected to networks and enables a theoretical engagement with media. Consequently this study takes seriously the resurgence of critical attention to aesthetics that has gained traction during the early years of the

twenty-first century, including movements such as the "New Formalism." Along with critics such as Ellen Rooney, I believe that a focus on aesthetics and form can maintain the political, social, and cultural dimensions introduced to literary criticism in the late twentieth century.[47] Certainly the category of aesthetics has often led to analytical foreclosure, historical sloppiness, and sociopolitical exclusion—especially when treated as a universal measure of taste, an invocation of textual transcendence, or a principle of canon formation. At the same time, the aesthetic qualities of a work actively inform and form a world (to which they nonetheless never wholly correspond). Thus, rather than regressing back to a decontextualized version of the aesthetic, formal, sensual, or affective, I follow scholars who have explored and historicized the political dimensions of aesthetics.[48]

One of the most important reconceptualizations of contemporary aesthetic theory and its political dimensions, one that is especially useful in framing my own formulation of network aesthetics, comes from Jacques Rancière. Rancière contends that the turn against aesthetics is not unique to the cultural and historicist developments of the late twentieth century but is "as old as aesthetics itself." "Aesthetics," for him, is a polyvalent term but also one that names a generative "confusion" that enables critics to analyze the "objects, modes of experience and forms of thought" that pertain to art. Thus "aesthetics" designates two related things: "a general regime of the visibility and the intelligibility of art and a mode of interpretative discourse that itself belongs to the forms of this regime." Even as some critics have attempted to eliminate the term, Rancière insists that the existence of art depends fundamentally on aesthetics insofar as this discourse demarcates "a specific form of visibility and discursivity . . . a specific distribution of the sensible tying it to a certain form of politics."[49] "Aesthetic acts," as he calls them, are "configurations of experience that create new modes of sense perception and induce novel forms of political subjectivity." Aesthetics are thus political because they not only constitute a discourse on art but also organize our very sense of "an idea of thought" itself.[50]

Rancière's precise articulation of aesthetics offers an illuminating way to think about network aesthetics. Drawing from Immanuel Kant (via Foucault), Rancière describes aesthetics as "the system of a priori forms determining what presents itself to sense experience."[51] Networks, as I have been discussing them in this introduction, are one of these historically significant "a priori forms." What I am calling a network imaginary draws upon this insight. In other words, a network marks a form mediated by myriad works of art—a category in which I include novels such as Don DeLillo's *Under-*

world, videogames such as thatgamecompany's *Journey*, and new media installations such as Paul Sermon's *Telematic Dreaming*. That a literary novel, a popular videogame, and a museum-based piece can at all be discussed in a series suggests a blurring between categories of high and low, and between avant-garde and popular forms, which began during earlier eras of modernism and postmodernism but has reached a new apex with digital media that make most cultural forms accessible via a single technological device. Mediation through all of these forms brings with it a particular configuration of the sensible that organizes space and time, visibility and invisibility, intimacy and distance, connection and disconnection, unified totality and provisional relation.

How, then, does such an account of aesthetics relate to the political? This characterization of network form may seem too broad to allow us, for instance, to imagine forms of art that would suggest a novel political program. And that is surely the case. As Rancière again observes, "The arts only ever lend to projects of domination or emancipation what they are able to lend to them . . . what they have in common with them: bodily positions and movements, functions of speech, the parceling out of the visible and the invisible."[52] Network aesthetics, as they play out in narrative art forms like the novel and procedural art forms like the videogame, mark both the dominating and emancipatory dimensions of networks. On the one hand, dystopian rhetoric has accompanied network politics primarily through discussions of technological surveillance, terrorist networks, and critiques of the distributed nature of US power by antiglobalization movements. On the other hand, communication networks from the telegraph to the Internet have also inspired utopian imaginaries and democratic dreams. This sense of utopian possibility with which networks have been repeatedly infused has also served, for instance, as a core affective and discursive undercurrent of US advocacy for globalization. Like material networks themselves, a network imaginary remains adaptable to myriad ends. Regardless, a network is no longer a wholly oppositional form, as it may once have been. Since the beginning of the twenty-first century, it has been as likely to be institutionalized by national militaries and transnational corporations as to be celebrated or employed by guerrilla fighters and hackers.[53]

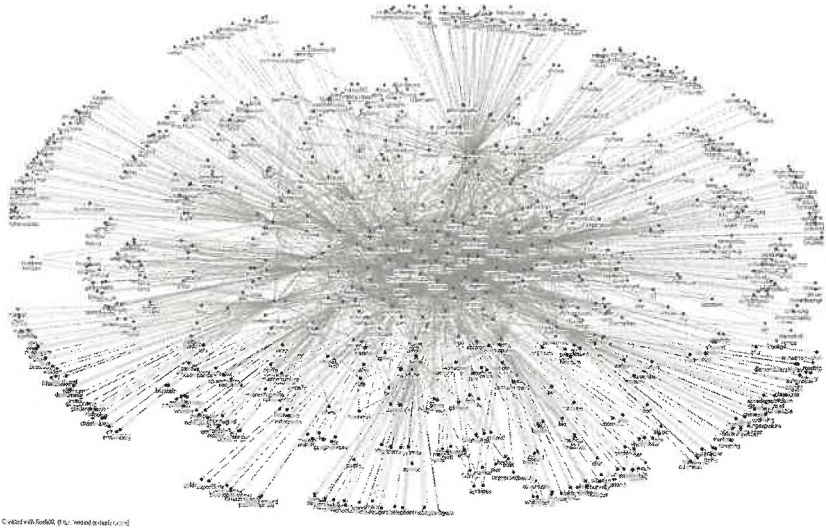
It is important to insist, then, that artworks that experiment with network aesthetics are political, fundamentally, not because of their specific representational tactics or strategic values. "Politics" is not a term reserved for negotiations, elections, campaigns, or ideologies.[54] It can serve, more capaciously, to describe a field of sensibility in which certain ways of being or particular lives—for instance, women, unarmed black men, or precar-

ious populations living outside of first-world digital networks—might be only distantly detectable or wholly unrecognizable. Like all art, the assemblage of work that I will be discussing is political, first and foremost, "because of the very distance it takes with respect to [society's structures and groups], because of the type of space and time that it institutes, and the manner in which it frames this time and peoples this space." Politics, in other words, has to do with the experience and configuration of *space, time, and social relations*. Literature and art are crucial domains of study, in the project of understanding networks, insofar as they disrupt the distribution of these elements within the cultural imaginary, "suspending the normal coordinates of sensory experience."[55] To show how aesthetics takes on specificity in the context of network form, and how it might open up varied experiences of contemplating relationality and being in relation, I turn now to my core concept of network aesthetics. Here, Rancière's notion of the "distribution of the sensible" yields to a more specific constellation of aesthetic encounters—what we might call *sensibilities of distribution*.

Network Aesthetics: From Control to Nonsovereignty

Networks raise many problems for aesthetic encounter. How, we might ask, can one see, sense, or perceive anything when everything is interconnected? One common approach to this problem in our time involves information visualization. The goal of such visualizations, as Lev Manovich describes them, is "to discover the structure of a (typically large) data set" whose form cannot be known in advance through key visual techniques (which also serve as epistemological principles) such as reduction and spatial properties. Since the 1990s, network visualizations have risen to prominence in the realm of information studies, offering advantages for making visible connections among data elements that bar charts, line graphs, and scatter plots do not.[56] Network visualizations use the familiar node-and-link structure to map practically any phenomenon from Internet traffic to brain activity to social entanglements (fig. 0.3). These visualizations are taken up primarily in the sciences, and are thus sometimes assumed to be representationally neutral; nevertheless, they invariably adopt an aesthetic charge. As Galloway observes, "Any visualization of data must invent an artificial set of translation rules that convert abstract number to semiotic sign."[57] Such conversion principles are at play between not only data and visualizations but also network form and its myriad translations into textual, visual, narrative, ludic, and participatory contexts.

While network visualizations exist purportedly to aid understanding



0.3. Network visualization of a Flickr tag search (Chris Moore, 2013). Creative Commons license (Attribution 2.0 Generic): https://www.flickr.com/photos/crypticon/8413214206.

in the sciences, representations of networks that serve primarily aesthetic purposes—for instance, in cyberpunk novels such as William Gibson's *Neuromancer* (1984)—more often emphasize the sublime boundlessness of networks that are open, extensible, and complex. This illimitable feeling points to both the synchronic (e.g., the massive scale of the Internet) as well as the diachronic (e.g., the transformation of the global economy at micro-temporal speeds) complexities of network phenomena. Galloway goes so far as to claim that the sublime has, both in the sciences and arts, become an all-consuming information aesthetic: "Every map of the Internet looks the same. . . . A word cloud equals a flow chart equals a map of the Internet. All operate within a single uniform set of aesthetic codes. The size of this aesthetic space is one." Lamenting the loss of an avant-garde in our time, and the blow this delivers to analytical thought, he concludes, "One can not talk about genre distinctions in this space, one can not talk about high culture versus low culture in this space, one can not talk about folk vernacular, nor about modernist spurs and other such tendencies."[58] For Galloway, this aesthetic uniformity suggests that networks remain, at least at present, unrepresented and perhaps, given their complexity, unrepresentable.

Though Galloway's observation about the aesthetic consistency of network images is persuasive, his claim about the unrepresentability

of networks resembles the common critique (really, the truism) that realist representation fails to totally capture its object. However, even if some things or totalities are "unrepresentable," they can still be encountered and experienced. The category of network aesthetics that I develop in this book seeks to complicate the claim that all engagements with networks reproduce the same aesthetic form, thereby leaving networks unrepresented. Instead, I argue that networks are made sensible and accessible through a wide variety of forms, genres, styles, and media that do not all point back to a single model of network sublimity. Undoubtedly, the sublime does remain important as an aesthetic strategy in our time, but it is vital to emphasize that even that aesthetic takes a multitude of forms.[59]

As opposed to the hierarchies implicit in the version of the sublime that appears in various discourses of romantic naturalism, theological metaphysics, and humanistic transcendence, the network sublime suggests a distributed sovereignty that undergirds an era of finance capital and neoliberalism. Networks, as they are mediated through cultural works, give this sociopolitical phenomenon a palpable form. Even as a network sublime resonates with romantic and modernist imaginaries, its representational logics are profoundly shaped by the politics of a long twentieth century of increased US global reach, which has included military, economic, and cultural aspirations that reached greatest visibility during the Cold War. As Alan Liu observes, "If the network is our contemporary intuition of infinity, then its boundlessness is matched by an equally infinite, equally unreal hunger for security."[60] On the one hand, networks—whether militarily inflected terrorist networks or commercial communications networks—carry with them a sense of limitless connection. On the other, these networks suggest a seemingly contradictory need for control that is ensured through everything from passwords to restrictions set on social media circles. Such security betrays a paranoid fear that dates back at least to Cold War Communist spy networks. This earlier anxiety about an external enemy mutated, by the late twentieth century, into a structural fear that ungoverned overreach may yield systemic collapse.

While my argument does not exclusively concern computer networks, the history of computing is nonetheless exemplary of the primacy of control in discourse about networks. The development that began during World War II and took off during the Cold War is overrun with the language of control. Cybernetics in the 1940s (linked in a variety of ways to computer science via figures such as John von Neumann) already marked its objective as the study of "control" and "communication" systems.[61] How-

ever, the height of linkage between computing and control arguably came in the 1980s. It was not merely scientific innovations or imaginative fictions that solidified this confluence of terms but also the period's emphasis on autonomous individuals. If the "personal computer" reified information and digital technology, then this process continued with *the transformation of networks into controllable things*. As Streeter explains, there are two commonly told (and seemingly competing) scholarly narratives about the rise of the Internet. The first story, exemplified by Paul Edwards's book *The Closed World*, is one of "visions of nuclear war and efforts to erase individuality through centralized command and control." This narrative focuses, for instance, on military development and posits the apocryphal core motivation of the ARPANET project as a national attempt to prepare for surviving a nuclear attack. The second story follows "the gradual triumph of decentralized personal computing over centralized, impersonal computing" that emphasizes "the triumph of personal freedom, individual *control*, and uniqueness."[62] What strikes me about these two accounts is that even though they emphasize seemingly opposite affordances of networked technologies (i.e., centralized command versus decentralized computing), they both rely on a core desire for control. Today, many of these underlying assumptions persist in narratives that imagine networks as reified objects that can be managed, bringing to mind technologies (e.g., a computer network that is "user-friendly") or unified threats (e.g., a terrorist network that can be defeated through military engagement).

Many of the most insightful scholarly analyses of networks still take the frame of control and sovereignty as their starting points. Networks are often addressed, in the humanities, through theories of decentralized and distributed sovereignty, such as the political theory of "Empire" and the "multitude" elaborated by Hardt and Negri. Similarly, Galloway and Thacker frame their manifesto on network ontology by declaring "network" a keyword for "the nature of control today, as well as resistance to it," and a "problem of sovereignty." The early twenty-first century, they explain, depends on a new "networked sovereign."[63]

Sovereignty has been a fruitful point of departure for political thought and a popular term since the early twentieth century, but it also limits what is seeable, sayable, and thinkable about networks. I take seriously Lauren Berlant's contention that sovereignty is a generally problematic starting place for thought. As she notes, "Sovereignty, after all, is a fantasy misrecognized as an objective state: an aspirational position of personal and institutional self-legitimating performativity and an affective sense of control

in relation to the fantasy of that position's offer of security and efficacy."[64] Berlant's broader understanding of sovereignty as a fantasy structure proves crucially important for an analysis of a network imaginary. If sovereignty, whether personal or institutional, is predicated on misrecognition of perceived mastery, how can it offer anything but a limited account of networks? If we assume that the normative or desired state of networks is one of stable control, how can we attend to the ways that networks reconstellate our ways of communicating, imagining, relating, and becoming—the forms of perpetual and everyday change that Stewart describes as "the *poesis*, or creativity, of ordinary things"?[65] Finally, if networks suggest a departure from an individualistic paradigm and an embrace of a worldview organized around distributed agency, and perhaps interdependence, what do we miss, analytically and affectively, if we begin network analyses with a primary concern about sovereignty?

My provocation, then, is to ask what a study of a network imaginary might look like if we instead take *nonsovereignty* as our analytical scattering point.[66] The concept of sovereignty helps Galloway and Thacker trace a coherent and flexible theory of networks as such, but it does not always enable them to attend closely to those heterogeneous elements of networks that they name in passing as "antagonistic clusterings, divergent subtopologies, [and] rogue nodes."[67] Technological infrastructures and protocols are surely important to any discussion of networks. These elements, however, make human experience secondary. They foreground control, management, and strategy over modes that are at least as common in network society—experiences of being ungoverned, disconnected, lost, laggy, intimately entangled, abandoned, frustrated, or broken down. Such experiences are not grand but profoundly ordinary. Still, this ordinariness matters to understanding social life in a historical moment when everything, in ways that can be both resonant and baffling, is construed as connected.[68]

The cultural works I analyze focus on ordinary experiences with networked technologies, communication, transportation, and social groups. To be clear, the aesthetic qualities of such works are not mere supplements to knowledge but rather unique ways of thinking through ordinary network relations. Two brief cultural examples from the 2010s—a text-based novel and a multimedia networked videogame—might offer a more concrete sense of the importance of the ordinary that is crucial to my concept of network aesthetics. The first work, Jennifer Egan's National Book Critics Circle Award–winning *A Visit from the Goon Squad* (2010), is a novel that tracks an ensemble of intersecting characters across numerous locations

(from New York City to Kenya) and times (from the late 1960s to the near future). Thematically, the novel takes up myriad topics associated with networks, including family structures, changes in social media, quantum entanglement, and intimate relations in contemporary America. The novel's form, however, is even more striking, as the text pursues a network perspective through frequent transitions among characters and narrative points of view (first, second, and third person, as well as a chapter that is structured as a PowerPoint slideshow). Rather than mapping a static structure, the novel gives the reader an experience of social and technological networks that change across time. *A Visit from the Goon Squad* avoids extraordinary events—the journalist Jules Jones, for instance, channels the novel's ars poetica through his worry that he has "no 'event'" to structure his celebrity profile of Kitty Jackson." Instead of tracking a single protagonist's interiority, this novel reflects upon ordinary affects and relations in the aggregate. The chapter that takes the form of Alison Blake's PowerPoint presentation documents her mother's annoying habits, an everyday conversation in the car, and her brother Lincoln's obsession with "rock songs that have pauses in them."[69] At the same time, however, Alison represents her family experience through mock graphs, diagrams, and visualizations that mediate the personal through big-data techniques that forge connections among characters but never yield a satisfying sense of comprehension of the novel's overall social network.

A second example, taken from videogame culture, is "Twitch Plays *Pokémon*," an online social experiment that began in February 2014 (fig 0.4). During this event as many as 121,000 participants played an emulated version of Nintendo's videogame *Pokémon Red* at the same time. Rather than merely participating in parallel, users joined this single-player game, online and simultaneously, inputting commands into a shared chat window. In the so-called Democracy mode, the game engine identified the most frequently selected command entered within a designated window of time and implemented that command in the game. Essentially, "Twitch Plays *Pokémon*" became an experiment in large-scale, real-time collaboration and collective intelligence. Remarkably, despite myriad errors, the network of thousands of simultaneous players completed the game in 16 days, 10 hours, 4 minutes, and 4 seconds. The experience of this event involved a dimension of network sublimity and awe about the fact of so many participants contributing to a single, coordinated event. But it also brought an important sense of the ordinary—and one that is considerably different from that evoked in Egan's novel. Here, the shared challenge of thousands

0.4. Twitch Plays *Pokémon* (2014).

of people improbably completing a single game together unfolded alongside frenzied button mashing, inadvertent comedy, aesthetic appreciation, off-topic chat, misalignment of goals, and moments of utter organizational chaos. The ordinary player interactions were organized around the form of an online game that not only represented a network but allowed players to participate in a live networking process whose parameters were constantly shifting, as people signed in and out, and others sought to convert chaos into order.

Through the influence of movements such as the digital humanities and the uptake of methods such as media archaeology, aesthetics have taken a peripheral position in media studies scholarship. I want to argue, however, that aesthetically oriented works (including both *A Visit from the Goon Squad* and "Twitch Plays *Pokémon*") use varied medium-specific affordances to open up sensitivities to ordinary networked experiences that scientific studies or sociological theories cannot accomplish alone. With network aesthetics, I ask: What might we learn about networks if we encounter them, often uncertainly, not as totalizing models but rather as immanent opportunities for thinking through human and nonhuman relations in the historical present? The objective of this book is not to solve the problems suggested by this question but to offer a robust account of the problematic that is network form.

In their attentiveness to ordinary situations and relations of a networked

society, cultural objects open up a key dimension of nonsovereignty by animating the irresolvable problematics of our time in a thick fashion. Art, Rancière contends, is "a practice of dissensus." This dissensus, which is an irreconcilable tension that defines aesthetics, emerges from "the rupture of a certain agreement between thought and the sensible" that we experience through a work of art that keeps readers or viewers at a distance while simultaneously drawing them in. Dissensus, moreover, captures the fundamental way in which the aesthetic is political—that is, dissensus generates "the suspension of power, the *neither . . . nor . . .* specific to the aesthetic state" that enables "a revolution that is no mere displacement of powers, but a neutralization of the very forms by which power is exercised."[70] This state of suspension is closely related to the nonsovereignty that I am proposing as the starting point for an analysis of networks. It is this inherent contradiction of art and literature that makes it so well suited for grappling with the internal complexities, unforeseeable emergences, and relational intensities that make up a network imaginary. Networks need not merely be control structures, management systems, or scientific graphs but can also serve as figures for encountering contemporary forms of what Adorno calls "contradiction." Networks, after all, suggest a culture that grows shallower even as it becomes increasingly interconnected.[71] They instantiate new forms of centralization but also introduce decentralization or distribution. They simplify the world and yet, as Michel Serres observes of systems, seem simultaneously to imbue it with new dimensions of complexity.[72] It is such tensions that constitute the analytical field of network aesthetics.

One crucial starting point for this project, which surely echoes throughout this introduction, is Fredric Jameson's "cognitive mapping." For Jameson, cognitive mapping is the "mental map of the social and global totality." Cognitive mapping is neither cartographic nor mimetic in nature. Instead, it is an "aesthetic" that can "enable a situational representation on the part of the individual subject to that vaster and properly unrepresentable totality which is the ensemble of society's structures as a whole."[73] Drawing from a Marxist sense of abstraction, Jameson posits cognitive mapping as a theoretical way of *knowing* the world without accurately *representing* it. Any knowledge of a historical period enframed by multinational capitalism, he contends, is an open-ended process—not a static itinerary or model meant to stand in for its object. It is, as the term deliberately suggests, a *mapping* rather than a *map*.

Cognitive mapping is a transhistorical concept that has unfolded across three major stages that Jameson sketches out, heuristically, as market, monopoly, and multinational capitalism. In each era, cognitive mapping

informs neither individual subjects nor the structure of the larger capitalist system but traces the relations between these terms. The first stage of classical market capitalism follows "a logic of the grid." In this era, Jameson argues, the map serves as a viable aesthetic form of mediation between individuals and larger systems of capitalism, which still retain a degree of correspondence. In contrast, the second stage of monopoly capitalism (or imperialism) creates an unbridgeable gap between individual experience and large-scale colonial systems. The key aesthetic technique that mediates the world of imperialism and gives its inconceivable global reality a form is allegory or figuration. Finally, the third stage of late capitalism, which encompasses the historical span that concerns me in this book, is "the moment of the multinational network." In this era, the earlier distance between domestic life in the West and the unknown foreign operations of empire cedes to a kind of global immediacy that inserts individuals into "a multidimensional set of radically discontinuous realities."[74] For Jameson, cognitive mapping remains a more uncertain or speculative aesthetic in this third stage of capitalism. As early as 1984 (the date of *New Left Review*'s original publication of "Postmodernism, or, The Cultural Logic of Late Capitalism"), he hypothesizes that an "aesthetic of cognitive mapping—a pedagogical political culture which seeks to endow the individual subject with some new heightened sense of its place in the global system—will necessarily have to respect this now enormously complex representational dialectic and to invent radically new forms in order to do it justice."[75]

Jameson does not offer an account of the "radically new forms" that might enable access to multinational capitalism in the future. Nearly three decades later, Galloway (who adopts Jameson's concept of "cognitive mapping" as well as Deleuze's "control society") insists that, still, "we do not yet have a critical or poetic language in which to represent the control society." This present-day, unrepresentable social model entails a movement from factories to multinational corporations, from the discrete material labor of industrialism to the flexible information labor of post-Fordism, from singular signatures to passwords, from uniform consumption to the monetization of diverse affects, from centralization to network form.[76] The core project of my book, and the close analyses that follow, is to demonstrate that we *do* in fact have the language for grappling with crucial experiences of (if not the totality of) finance capital, control societies, and network form. That language may be provisional and in process, but it already extends across media from novels and poetry to film and television to videogames and transmedia storytelling—and beyond.

If it is now commonplace to organize the world of the late twentieth and

early twenty-first century, from its microscopic to its macroscopic scales, in network terms, then it is important to emphasize that US cultural production during this period has played a major part in this paradigmatic shift. Network aesthetics, in my usage, operate across media. In literary fiction, novels such as Marge Piercy's *He, She and It* have used narrative form to grapple with a world transformed by transnational corporations. In poetry, texts such as Jena Osman's *The Network* follow etymological and historical networks through their processes of emergence. In cinema, especially since the early 1990s, films from Robert Altman's *Short Cuts* to Steven Soderbergh's *Contagion* have depicted interlinked systems through crosscutting, audio bridges, and parallel narratives. On television, series such as *The Wire* approach social networks through experiments with seriality. In comics such as Warren Ellis's *Global Frequency*, we see medium-specific elements such as panels and gutters, as well as ekphrastic techniques that gesture toward video and computational media, that invoke the use of networked organization to address networked threats. Museum-based artworks such as Sharon Molloy's painting *Transient Structures and Unstable Networks* and installations such as Chiharu Shiota's *In Silence* make networks visible and tangible, inscrutable and haunting, without instrumentalizing them in the service of information visualization. Alongside such sequential narrative and static artistic forms, diverse digital media have approached networks through a variety of nonlinear procedures, processes, and protocols. These works, for instance, have included real-time software art (Jason Salavon's *Rainbow Aggregator*), networked mobile art (Julian Oliver's *No Network*), interactive narratives (Christine Love's *Digital: A Love Story*), videogames (From Software's *Dark Souls*), virtual worlds (Tale of Tales' *The Endless Forest*), and alternate reality games (Microsoft's *The Beast*).

To clarify, my concept of network aesthetics does not aim to identify a new genre that informs a wide range of fiction, poetry, film, television, comics, videogames, and digital media. More substantively, the diverse cultural works that I analyze use aesthetic strategies to render, intensify, and influence the way we understand and interface with a network imaginary. They enable readers, viewers, and players to think about networks not merely by knowing or representing them but by *feeling and inhabiting* them, often through ordinary scenes, interruptions, and contradictions. Cultural works, then, open up concentrated access to forms of participation, interaction, absorption, and apophenia as well as less controlled experiences of overload, confusion, distance, and paranoia that defamiliarize a networked historical moment.

Networks appear most like sovereign forms when they are treated as static totalities, for instance in information visualizations that foreground spatial structures rather than assemblages that change over time. All of the cultural works that I explore in this book, however, posit a sense of time, duration, change, and emergence (a concept I take up in chapter 2). Across sites and situations, network aesthetics emphasize not merely that everything is connected but that people and things connect, intersect, disconnect, become, atrophy, transform, or emerge over time. Therefore, while I deploy the term "form" frequently in this book, I do so not to signify something merely synchronic. The art critic Nicolas Bourriaud proposes a useful shift from a language of "forms" to one of "formations." This latter term makes thinkable dynamic relations, developed across time, between artworks and other artistic, social, or political situations. The term "formation" captures the emergent and process-oriented properties of "form." Even so, I often use these words interchangeably, in order to stress that this dynamic sense of formation is already active in earlier cultural theory, as it is in Raymond Williams's analysis of televisual "form" in terms of "flow."[77] Network form is, thus, a process-based concept. As Anna Munster observes in her analysis of avant-garde net art, "Even if a network image is static, imagining it durationally means acknowledging its constitutive dynamism." Thus, instead of the network, Munster proposes a shift to the language of "networking."[78] I carry forward this insight, while also maintaining that such processes are never implicitly utopian or oppositional—even the word "networking" thrives in corporate business practices and cyberlibertarian manifestos alike.

A Transmedia Method for New Media Culture

This book borrows methods from numerous disciplines, including literary criticism, media theory, cultural analysis, art history, critical theory, online archival work, self-observation, and practice-based research. My primary means of elucidating a network imaginary is to explore how numerous media grapple with the limits and possibilities of network form. For example, a short story collection such as Walter Mosley's speculative *Futureland* (2001) makes sensible sociopolitical networks through linear narrative accounts of multiprotagonist experiences of race and class in an era of digitally mediated capitalism. In a different medium, Rob Wittig's "email fiction" or "chatmail" *Blue Company* (2001–2) uses serial email delivery and narration of ordinary events to communicate the intimacies

and gaps inherent in both online romances and affective labor. In yet another way, the videogame *Killer Flu* (2009) invites a player to role-play an avian flu pandemic to demonstrate that panic is an inappropriate response to global infectious disease networks. Networks, across these works, are surely not identical concepts. Nonetheless, each work makes sensible certain problems of network form.

The term "media," which is central to this study, refers most often either to channels of communication or to material elements or platforms that enable expression. The former sense is most common to communication and media studies; the latter is more often used in fields such as English and cultural studies.[79] My concept of network aesthetics speaks to both senses of media, insofar as it examines the interplay between networked communication systems and artistic forms. My method, throughout this book, draws heavily from media studies. I attend to *medium specificity* (that is, each chapter focuses on the way a different artistic medium takes up networks) but also insist on the fundamental *transmedia ecology* within which all of my selected late twentieth- and early twenty-first-century works emerge. This comparative media approach responds to the specificity of the problem of network form in two key ways.[80]

First of all, if the mantra of the present is that everything is interconnected, comparison itself becomes difficult. As the cultural anthropologist Arjun Appadurai has asked, "How can we compare social objects in a world where most such objects, whether nations, ideas, technologies, and economies, seem deeply interconnected"?[81] Despite the way that network form complicates the drawing of distinctions, comparison remains the basis not only of fields like comparative literature but also of conceptual thought throughout the humanities. It would be premature to conclude that networks threaten the humanities (though, of course, such rhetoric has been a common part of discussions about a humanities crisis in an era dominated by digital technologies and STEM education). Instead, network form challenges us to develop new methods that enable even more nuanced ways of analyzing our historical present.

The second way in which a media comparison emerges out of the problem of the network has to do with developments in networked media. As Henry Jenkins has argued, the digital revolution of the late twentieth century has dramatically altered our media ecology. In particular, we have seen the rise of what he calls a "convergence culture" in which users are expected to move across various media and platforms to make their own connections.[82] Sometimes, this culture manifests in fictional worlds that

stretch across multiple media—as with the constellation of the *Matrix* films, comics, videogames, and virtual worlds that Jenkins discusses. More broadly, the term "transmedia" also captures the frequent and rapid oscillation among artistic media—often on a single screen—that has become a regular part of life in the early twenty-first century.

The current transmedia ecology encourages a scholarly approach of the sort that I am suggesting here—one that maintains clarity about distinct media properties while simultaneously oscillating among media to gain a better sense of their interactions. Such comparative work takes place in media studies but also exceeds it. As Appadurai again observes, "We need to probe the cohabitation of forms, such as the novel and the nation, because they actually produce new contexts through their peculiar inflection of each other."[83] The primary objective of this study is, along the lines that Appadurai suggests, to probe the cohabitation of forms. Network form, in this case, only becomes thinkable relationally, for instance through the seriality that is common to television or through the ludic play that characterizes videogames. Such juxtapositions and interplays defamiliarize network forms by demonstrating that what may appear both ubiquitous and total in our time is, in fact, heterogeneous, fractal, but also mutable.

Human and Nonhuman: Affects and Networks

Along with scholars such as Marshall McLuhan, Friedrich Kittler, Katherine Hayles, Andy Clark, Brian Rotman, Bernard Stiegler, Bernhard Siegert, and Mark Hansen, I believe that we think through, alongside, against, and in concert with media.[84] Moreover, if we take "think" to signify only rational comprehension, it is crucial to add that we also feel and change and give ourselves over to—that is, *affect*—our world through media. Before laying out my precise itinerary for the following chapters, and the works that serve as my core examples, I would like to raise one final theoretical point about the importance of the human and nonhuman dimensions of networks.

My focus on the aesthetic and formal aspects of artistic and literary works created for human audiences may seem conservative at a moment in which scholarship in the humanities has turned increasingly to the nonhuman. We see this interest in a broad range of analyses concerned with areas such as posthumanism, animal studies, speculative realism, and object-oriented philosophy.[85] The same is true in media studies. Media theorists such as Kittler have emphasized the radically nonhuman dimensions

of media as they "determine our situation," while Galloway and Thacker have, in a more specific way, focused on the nonhuman aspects of networks.[86] Bernhard Siegert declares that with the rise of communications networks, "human beings have ceased to be the relays of history."[87] At the same time, other critics have insisted upon the bodily and affective dimensions of media. Mark Hansen, drawing on the work of Henri Bergson, contends that digital media operate "squarely in the domain of experience" and that matter and images do not exist without being perceived and processed by a human being. For him, "media art," in particular, is "rooted in embodied affectivity" that entails "the capacity of the body to experience itself as 'more than itself' and thus to deploy its sensorimotor power to create the unpredictable, the experimental, the new." In his later work, Hansen has further argued that networked technologies facilitate especially crucial mediations between human beings and nonconscious affect. Social media networks, in particular, foreground the role of technics as a way of generating affect among users.[88] For example, people's ambient relationships to Facebook (which remains, like personal computers themselves, perpetually in the background of work and life tasks) make clear the place of digital media in enabling sustained human encounters.

This book focuses on cultural works created for human users, but it also remains attentive to the nonhuman dimensions of the media that ground them. Following critics such as Hayles, I pursue a middle ground between the more extreme positions in media studies that we see in the work of scholars such as Kittler and Hansen. In other words, I am interested in "the dynamics entwining body and machine together."[89] Research on social media networks suggests the importance of reading contemporary sociality through the interplay between human interactions and nonhuman, automated networks.[90] Aesthetics serve as one critical interface between the nonhuman and human aspects of networks. Even as nonhuman entities and processes play an increasingly important role in our world—through network protocols, algorithmic stock trading programs, and web systems that change with real-time big-data processing—aesthetic encounters offer human beings a way of speculating about and intervening in such systems.[91] A great deal of contemporary art might even be said to emerge from the very inaccessibility and incomprehensibility of network technologies. In turn, the nonhuman elements of networks that operate at spatial and temporal scales beyond human conception become approachable through art. Network aesthetics track processes that exceed human cognition because they either fall under the threshold of perception (e.g., subconscious effects

of social media) or overload an individual's real-time processing capacity (e.g., complexities of a global political system).

In order to capture the interplay between the human and the nonhuman, and between individuals and networks, this book often draws on affect theory or nonrepresentational theory.[92] I elaborate "affect" locally in the chapters where it most centrally appears (chapters 2 and 4). At the outset, however, it is worth noting that the language of affect has much in common with the discourse surrounding networks. Affect can be understood as a "non-conscious experience of intensity" that differs from either emotion or feeling. It captures "unformed and unstructured potential."[93] Affect, however, also concerns interpersonal relations and networks. As Brian Massumi observes, "The body doesn't just absorb pulses or discrete stimulations; it infolds *contexts*, it infolds volitions and cognitions that are nothing if not situated." In the early twenty-first century, contexts come to be framed in network terms. Moreover, communication systems represent a key infrastructure for the experience, management, and production of affects: "The network distributes. Interlinks. Relates. The network is the relationality of that which it distributes. It is the being of collective becoming. Communicational technologies *give body to relationality as such*."[94] My concept of network aesthetics accentuates already-existing intersections between network theory and affect theory.[95] Through the analyses that follow, I consider affects as they unfold not only in social media but also across a broader range of media that seek to channel, make sensible, resonate with, problematize, or simply intensify our experience of and with networks—which is to say, the thick contemporaneity of our technologically driven culture.

A Mapping: Nodes and Links

Network Aesthetics explores what Appadurai calls a "cohabitation of forms." Each chapter examines how a different literary or artistic form attempts to make sense of network form and to configure the contradictions that it presents. Therefore, every chapter offers a brief overview of the form in question (e.g., maximalist novels or complex serial television shows) and offers a sustained analysis of one or more examples. These examples are meant to be "singular" in Massumi's sense of being "neither general (as is a system of concepts) nor particular (as is the material to which a system is applied)."[96] In this relational sense, an example can be thought of as a network *node* that cannot be entirely systematized but nonetheless connects to

a variety of other examples. Thus, in each chapter I situate my selected cultural works in relationship to other works to which they connect formally and thematically.

At the same time, I attend to the unique aesthetic insights that each work offers about network form. Though the distinction between "high" and "low" art is less and less relevant in our twenty-first-century transmedia ecology, it is worth noting that many of my examples are populist artworks that belong to a late moment of what Benjamin called "technological reproducibility."[97] These selections surely have something to do with my own tastes. At the same time, with this particular constellation of nodes, I seek deliberately to expand the discussion of network art that has been regularly restricted to avant-garde productions. Too often, obscure experiments or museum-bound new media art pieces, intellectually illuminating and philosophically generative though they may be, restrict our sense of how key concepts travel through and influence cultures. Nonetheless, I have selected examples that are formally instructive about the features of a network imaginary and that clearly foreground a particular quality of network aesthetics that appears in many other cultural works.

If the examples in this book are *nodes*, the concepts that these examples illuminate and share among them can be thought of as *links*. As I have noted, "network aesthetics" is not an easily definable category like a genre or artistic movement. Each chapter, therefore, foregrounds *a specific guiding aspect* of network aesthetics: what I call their "maximal," "emergent," "realist," "participatory," and finally "improvisational" dimensions. These categories are not mutually exclusive but are indeed copresent in many of the works I analyze. Moreover, each chapter locally takes up a number of philosophical keywords that are essential to the humanities but have been complicated and forever altered by the network form. These concepts include "event," "accident," "emergence," "realism," "play," "process," and "failure," among others. These concepts serve both to clarify and, through their specificity, to disrupt the more monolithic concepts of the network, imagined as a definite and uniform structure.

The first part of *Network Aesthetics* turns to linear narrative forms. I focus here on media that emerged prior to World War II but have continued to develop in the late twentieth and early twenty-first centuries. Chapter 1 examines maximalist American novels from the late 1990s, especially Don DeLillo's *Underworld* (1997) and Neal Stephenson's *Cryptonomicon* (1999). These texts grapple with a language of networks that signals both the ongoing effects and the decline of US hegemony in the late twentieth century.

Figurative language and formal experimentation in these novels frame networks as historical structures that can be experienced, even as they ultimately surpass human comprehension, as well as novelistic form. The second chapter approaches films that explore the emergent qualities of networks and takes up Stephen Gaghan's *Syriana* (2005). This film's cinematic montage and multiprotagonist narrative structure mark parallels and divergences between privileged US subjects and precarious migrant workers in the Middle East. These techniques also foreground networks as systemic processes that unfold in highly politicized terrorist collectives across time. This chapter explores network films in order to demonstrate how cinema generates a different understanding of the concept of the "accident" in our era of interconnection—including the narrative of terrorist "blowback" that still remains a key frame for understanding the war on terror. The third chapter focuses on David Simon's *The Wire* (2002–8) in order to analyze the relationship between seriality and network form in the broader context of American television. Here, I attend to the ways that *The Wire* and other serial dramas complicate "realism" and aestheticize social and economic networks through medium-specific televisual techniques. My analysis also interrogates the ways that televisual form gives us access to Latour's actor-network theory and an understanding of social networks.

All of the artistic media discussed in these opening chapters—novels, films, and television series—stage the interplay between linear storytelling techniques and nonlinear systemic structures. How, I ask in these contexts, do network aesthetics enable readers and spectators to negotiate the antinomies—of linearity and nonlinearity, connection and disconnection, chronology and distribution—that mediate experiences of networks? Moreover, how does the clash of formal logics in each of these works take up the US situation of the late twentieth and early twenty-first centuries in ways that privilege ordinary interactions among webs of actors, rather than individual protagonists?

The works in the first part of the book interrupt conventions of older media while also adapting them to a context of a postindustrial, networked society. In the second part, I consider media that rely on the World Wide Web itself to understand and reshape networks. These digital artworks are process-driven, interactive, nonlinear, cocreated, and explicitly dependent on networked audiences. These chapters focus on different types of digital games (including computer, video, and transmedia games). I contend that this popular form serves as an instructive microcosm, if not quite the paradigmatic case, for the larger digital media situation that has become a key

object of study for new media studies and the digital humanities. Through their mechanics, procedural capacities, navigable worlds, and multimedia interactions, digital games demand ways of perceiving and working that open up new experiences of network form. They also reconfigure our relations to media that arose within earlier historical moments. Therefore, the second part of the book involves a deliberate shift in voice and method that corresponds with the unique affordances of digital media and participatory cultures. Specifically, while the first three chapters tend toward formal, cultural, historical, and theoretical analysis, these final chapters also incorporate archives and techniques that are suggested explicitly by the computer networks and the maker ethics that accompany gaming culture.

The fourth chapter, then, delves into the ways that videogames have engaged in substantive and meaningful experiments with networks that privilege participatory aesthetics. In particular, I examine Introversion's popular single-player simulation game *Uplink* (2001) and two "artgames" that depend on online play—Jason Rohrer's *Between* (2008) and thatgamecompany's *Journey* (2012). Alongside close formal readings of these games, I employ self-reflection on my own gameplay and an analysis of online documents that include creator commentaries, game reviews, and player-created blogs. The networked nature of these games gives us a different access to the concepts of "control," "action," "extimacy," and "play." The fifth and final chapter looks at the emerging and avant-garde new media form of alternate reality games (ARGs) that creates transmedia storytelling platforms composed of text, video, audio, phone calls, websites, email, social networks, locative technologies, and other media. More than any other artistic form explored in this project, ARGs from *The Beast* (2001) to *Superstruct* (2008) rely on and complicate participatory social networks by means of their improvisational elements. Because designers do not announce ARGs explicitly as fictional or ludic experiences, their game aesthetics blur with the ordinary dimensions of everyday networked life. In this final chapter, I explore the digital humanities method of practice-based research as a mode of inquiry into networks. The key node in this chapter is *The Project* (2013), an ARG that I codesigned. The experience of designing this game enables me to analyze networks from an insider perspective, taking up such concepts as "process," "collaboration," and "failure."

Though the nonsovereignty of networks is a concern throughout this book, this concept appears most centrally in these final two chapters. A short coda then turns from the book's core task of making sense of network form and reflects instead on the question of whether it is possible to

envision an outside to our contemporary network imaginary. Instead of a strategy of avant-garde newness or negational opting out, this final section sketches out a pedagogy of ambivalence that is intensely present to the potentials and mutations of our network imaginary.

Conclusion: Network Experience

In his sociological study of computer-based communication, Streeter shows that the Internet did not become a mainstay of US culture until a host of technological, political, and economic elements were in place. Most important to the popularization of the Internet were the experience and feel of networks. Computer networks became the essential technology of our time largely because of experiences that had less to do with technical innovations than with design and social interactions. More than the rational benefits of packet switching, for instance, potential users were drawn to the email communication, experiences of multitasking, pleasures of graphical user interfaces, and satisfaction of interactivity that network computers promised.[98] As Streeter shows, we can track such feelings through a variety of documents and events, including political debates and legal proceedings. We can also access them through a uniquely aesthetic mode of thought.

In the chapters that follow, I explore what network aesthetics might teach us about the unfolding culture of the twenty-first century. At moments throughout the book, however, I also gesture toward realms that exceed, at least at present, not only the knowable but also the sayable, seeable, audible, and playable. Similarly, I explore what might be lost or feel lost in an all-consuming and, at times, a seemingly compulsory participation in networks. Such promises and risks, I contend, are perhaps the best reasons to take network aesthetics seriously.